



# UNITED STATES PATENT AND TRADEMARK OFFICE

UNITED STATES DEPARTMENT OF COMMERCE  
United States Patent and Trademark Office  
Address: COMMISSIONER FOR PATENTS  
P.O. Box 1450  
Alexandria, Virginia 22313-1450  
www.uspto.gov

APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
-----------------	-------------	----------------------	---------------------	------------------

10/539,133

06/15/2005

Kazushi Wada

09792909-6288

2272

26263

7590

05/28/2008

SONNENSCHN NATH & ROSENTHAL LLP

P.O. BOX 061080

WACKER DRIVE STATION, SEARS TOWER

CHICAGO, IL 60606-1080

EXAMINER

KUO, WENSING W

ART UNIT

PAPER NUMBER

2826

MAIL DATE

DELIVERY MODE

05/28/2008

PAPER

**Please find below and/or attached an Office communication concerning this application or proceeding.**

The time period for reply, if any, is set in the attached communication.

<b>Office Action Summary</b>	<b>Application No.</b> 10/539,133	<b>Applicant(s)</b> WADA, KAZUSHI	
	<b>Examiner</b> W. Wendy Kuo	<b>Art Unit</b> 2826	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

### Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

### Status

- 1) ☒ Responsive to communication(s) filed on 05 March 2008.
- 2a) ☒ This action is **FINAL**.                      2b) ☐ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

### Disposition of Claims

- 4) ☒ Claim(s) 1-20 is/are pending in the application.
- 4a) Of the above claim(s) 12-20 is/are withdrawn from consideration.
- 5) ☐ Claim(s) \_\_\_\_\_ is/are allowed.
- 6) ☒ Claim(s) 1-11 is/are rejected.
- 7) ☐ Claim(s) \_\_\_\_\_ is/are objected to.
- 8) ☐ Claim(s) \_\_\_\_\_ are subject to restriction and/or election requirement.

### Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☒ The drawing(s) filed on 15 June 2005 is/are: a) ☐ accepted or b) ☒ objected to by the Examiner.  
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).  
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

### Priority under 35 U.S.C. § 119

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All    b) ☐ Some \*    c) ☐ None of:
1. ☐ Certified copies of the priority documents have been received.
  2. ☐ Certified copies of the priority documents have been received in Application No. \_\_\_\_\_.
  3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

\* See the attached detailed Office action for a list of the certified copies not received.

### Attachment(s)

- |  |   |
|--|---|
| 1) <input type="checkbox"/> Notice of References Cited (PTO-892)                       | 4) <input type="checkbox"/> Interview Summary (PTO-413)           |
| 2) <input type="checkbox"/> Notice of Draftsperson's Patent Drawing Review (PTO-948)   | Paper No(s)/Mail Date. _____                                      |
| 3) <input checked="" type="checkbox"/> Information Disclosure Statement(s) (PTO/SB/08) | 5) <input type="checkbox"/> Notice of Informal Patent Application |
| Paper No(s)/Mail Date <u>04/10/2008</u> .  | 6) <input type="checkbox"/> Other: _____                          |

### **DETAILED ACTION**

1. Claims 1-20 are pending with claims 12-20 withdrawn from further consideration as being directed to a non-elected invention.

### ***Drawings***

2. The drawings are objected to as failing to comply with 37 CFR 1.84(p)(5) because they do not include the following reference sign(s) mentioned in the description: **4 of Figure 2B** (mentioned in paragraph [0029]). Corrected drawing sheets in compliance with 37 CFR 1.121(d) are required in reply to the Office action to avoid abandonment of the application. Any amended replacement drawing sheet should include all of the figures appearing on the immediate prior version of the sheet, even if only one figure is being amended. Each drawing sheet submitted after the filing date of an application must be labeled in the top margin as either "Replacement Sheet" or "New Sheet" pursuant to 37 CFR 1.121(d). If the changes are not accepted by the examiner, the applicant will be notified and informed of any required corrective action in the next Office action. The objection to the drawings will not be held in abeyance.

### ***Claim Rejections - 35 USC § 102***

3. The text of those sections of Title 35, U.S. Code not included in this action can be found in a prior Office action.
4. **Claims 1-4, 6-7, and 11 are rejected under 35 U.S.C. 102(e) as being anticipated by Inagaki (US 6,765,246) (hereinafter Inagaki).**

5. With respect to claim 1, Inagaki (e.g. Figure 1) teaches a solid state image pickup device **comprising:**

- **a semiconductor region 7 formed on a substrate 5** (Figures 2 and 3);
- a plurality of photo-sensors 1 **on the semiconductor region;**
- a transfer register 2 **formed in the semiconductor region which transfers** (column 6, lines 5-9) signal charges accumulated in said photo-sensors (column 5, lines 49-51); **and**
- an impurity region 13 (horizontal gridlines between adjacent photodiodes in vertical direction) **continuously** formed **in the semiconductor region** in a direction orthogonal to the transfer (vertical) direction of said transfer register (column 6, lines 39-52), **wherein,**
- said impurity region **is** provided at a position between said photo-sensors 1 adjacent to each other along the transfer direction of said transfer register **in the semiconductor region**



6. With respect to claim 2, Inagaki (e.g. Figures 2 and 3) further teaches that the impurity region 13 is formed at a position ***in the semiconductor region*** deeper than said transfer register (vertical CCD) (column 6, lines 2-4 and lines 39-42).

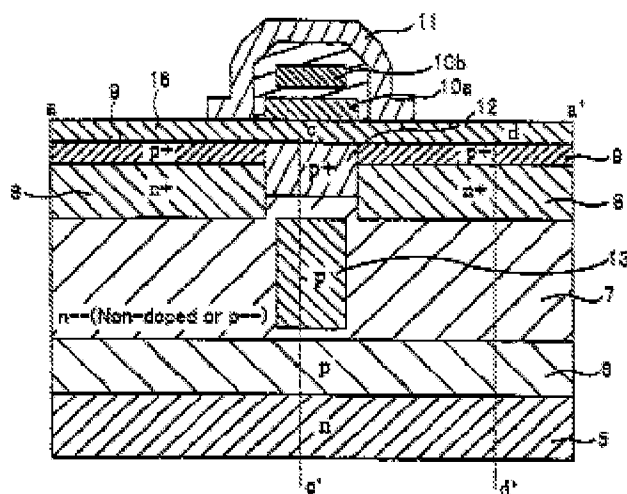


FIG. 2

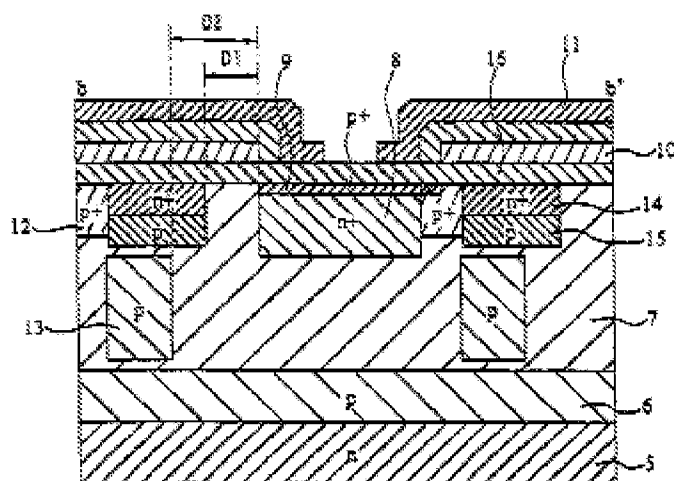


FIG. 3

7. With respect to claim 3, Inagaki (e.g. Figure 6) further teaches a plurality of said impurity region portions (13a-13c) are formed in the ***semiconductor region*** (column 11, lines 4-8).

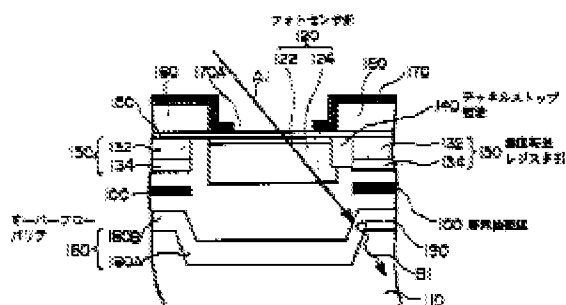
8. With respect to claim 4, Inagaki (e.g. Figure 2) further teaches that a channel stop region 12 comprised of an impurity region is formed, ***separately from said impurity region***, between said photo-sensors (photodiodes) adjacent to each other along the transfer (vertical) direction of said transfer register (column 6, lines 34-38) and in the vicinity of the surface of said ***semiconductor region***.
9. With respect to claim 6, Inagaki (e.g. Figure 6) further teaches that in addition to said impurity region portion 13, a first barrier portion 15 comprised of an impurity region is provided at a position between said photo-sensors (photodiodes) adjacent to each other in the transfer direction of said transfer register and shallower relative to said impurity region portion as viewed from the ***semiconductor region*** (column 6, lines 46-49).
10. With respect to claim 7, Inagaki (e.g. Figure 1) further teaches a second barrier layer 13 (vertical gridlines between adjacent photodiodes in horizontal direction) (column 6, lines 39-52) comprised of an impurity region portion formed along said transfer register.
11. With respect to claim 11, Inagaki further teaches that the impurity region portion (13 horizontal gridlines) and the second barrier region portion (13 vertical gridlines) are located at the same depth (column 10, lines 56-64).

***Claim Rejections - 35 USC § 103***

12. The text of those sections of Title 35, U.S. Code not included in this action can be found in a prior Office action.

14. With respect to claims 5 and 8, Inagaki remains as applied to claims 1 and 7 above, respectively.

Inagaki fails to teach that the overflow barrier is in a projected and recessed shape at an interface thereof in the direction of said substrate, and a projected portion of said projected and recessed shape is disposed at a position corresponding to a position between said photo-sensors. Komatsu teaches that the overflow barrier is in a projected (shallow) and recessed (deep) shape at an interface thereof in the direction of said substrate, and a projected portion of said projected and recessed shape is disposed at a position corresponding to a position between said photo-sensors (see abstract figure) in order to prevent color mixing and smear by limiting the move of a signal charge between adjacent photosensor sections.



It would have been obvious to one of ordinary skill in the art at the time of the invention to provide the image pickup device of Inagaki with the overflow barrier of



Komatsu for the benefit of preventing color mixing and smear by limiting the move of a signal charge between adjacent photosensor sections.

15. With respect to claims 9 and 10, Inagaki as modified by Komatsu remains as applied to claims 5 and 8 above, respectively. Inagaki further teaches that the impurity region portion 13 is higher than said overflow barrier 6 in impurity concentration (column 7, lines 48-51 and 55-58).

### ***Response to Arguments***

16. Applicant's arguments filed 05 March 2008 have been fully considered but they are not persuasive.

17. Regarding Applicant's response that Inagaki "fails to disclose an impurity region continuously formed in a direction orthogonal to the transfer direction of a transfer resistor," it is respectfully noted that impurity region 13 is formed in a grid-like pattern, and it is the horizontal gridlines of impurity region 13 that are orthogonal to the transfer direction (column 6, lines 39-52).

### ***Conclusion***

18. **THIS ACTION IS MADE FINAL.** Applicant is reminded of the extension of time policy as set forth in 37 CFR 1.136(a).

A shortened statutory period for reply to this final action is set to expire THREE MONTHS from the mailing date of this action. In the event a first reply is filed within TWO MONTHS of the mailing date of this final action and the advisory action is not

mailed until after the end of the THREE-MONTH shortened statutory period, then the shortened statutory period will expire on the date the advisory action is mailed, and any extension fee pursuant to 37 CFR 1.136(a) will be calculated from the mailing date of the advisory action. In no event, however, will the statutory period for reply expire later than SIX MONTHS from the mailing date of this final action.

Any inquiry concerning this communication or earlier communications from the examiner should be directed to W. Wendy Kuo whose telephone number is (571)270-1859. The examiner can normally be reached Monday through Friday 7:00 AM to 4:30 PM EST.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Sue A. Purvis can be reached at (571) 272-1236. The fax phone number for the organization where this application or proceeding is assigned is (571) 273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.

/Leonardo Andújar/

W. Wendy Kuo

Application/Control Number: 10/539,133  
Art Unit: 2826

Page 10

Primary Examiner, Art Unit 2826

Examiner  
Art Unit 2826

WWK